GEELONG NATURALIST

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CONTENTS

Club Notices, News Bites		1
Out and About	Valda Dedman	2
Plant Group	Dick Southcombe	3
Biodiversity Group Workshop Report	Claire Greenwell	3
President's Message	Diana Primrose	3
Important Find at Jerringot	Dave King & Valda Dedman	3
The Bull Ant – An Uninvited Guest	Dave King	4
Bird of the Month – Darter	Valda Dedman	5
New Ideas on Victorian Geology talk given by David Taylor at the May General Meeting	Roy Whiteside	6
Bound for South Australia	Ray Baverstock	8
AGM – Reports by Dave King &Valda Dedman	Roy Whiteside	10
Excursion to Lake Corangamite & Stony Rises with Colac SGAP	John James & Joe Hubbard	12
Mid-week Bird Group Excursion Report	Brian Hart	13
Bird Group Report	Trevor Pescott	14
Bird Group Observations	Rob Ganly & Marilyn Hewish	15

COMING EVENTS

JUNE	4	General Meeting	Geelong's Botanical Revival — John Arnott
	7-10	Campout	Little Desert — Leader: John Bottomley
	11	Plant Group	Workshop meeting
	15	**Excursion (N.B. Saturday)**	Melbourne Aquarium Behind the Scenes — Leader: Claire Greenwell
	18	Bird Group	Malaysian Birds — Susan Myers
	20	Mid-week Bird Group Excursion	Blue Circle Cement — Leader: Pat Streefkerk
	25	Biodiversity Group	Workshop Meeting
JULY	2	General Meeting	Weather Wonders of Geelong — Lindsay Smail
	4	**Mid-week Bird Excursion**	Ocean Grove Nature Reserve — Leader: Brian Hart
	TBA	Winter Wader Count	
	9	Plant Group	Workshop Meeting
	16	Bird Group	Freckled Ducks — John Bottomley
	21	Excursion	Eastern Wombat Forest — Leaders: John Bottomley, Noel Schleiger
	23	Biodiversity Group	Workshop Meeting
	30	Mammal Group	

The Club Website & home page – the new address

GFNC Web page: http://home.vicnet.net.au/~gfnc/

No email address: please use email addresses of committee members on the back page

Tonight's speaker is John Arnott.
He will be speaking on Geelong's Botanical Revival.

Next month's speaker will be LINDSAY SMAIL, BA, TSTC, ThC, MASWA
He is the Director of GEELONG WEATHER SERVICES.

Lindsay Smail was a teacher at secondary and tertiary levels for over 30 years. His original degree included studies in meteorology, climatology and geography at the University of Melbourne and since those times he has continued his studies and developed his education and experience in atmospheric science.

The author of a number of books, essays, papers and newspaper columns, he has recently published a book entitled *Weather Wonders of Geelong*, which examines the impact of severe weather events in the Geelong region of Australia since the advent of white settlement in the 1830's.

Since 1997 he has operated Geelong Weather Services, an independent reporting, operational meteorology and consultancy business.

Website address: http://users.pipeline.com.au/gws
Email address: gws@pipeline.com.au

NEWS BITES!

- At a meeting this morning the Liberal Party formally voted to support the legislation to create Victoria's marine national parks and marine sanctuaries.
  The decision secures the support of the Liberal Party in both the Lower House and the Upper House.
  The legislation to create Victoria's marine national parks and marine sanctuaries will be passed by June 13th.

- The city of Newcastle has won a World Environment Day Award, with help from CSIRO energy scientists.
  CSIRO Energy Technology partnered with Newcastle City last year to support its ClimateCam program - a web-based greenhouse gas measurement tool (www.climatecam.com) that tells Newcastle residents how much greenhouse gas the city is emitting monthly.
  Read more at: http://www.csiro.au/page.asp?type=mediaRelease&id=Prgreenhouse

CLUB EXCURSION – SATURDAY 15 JUNE, 2002

EXTRA SPECIAL BEHIND THE SCENES AT THE MELBOURNE AQUARIUM

Train departs 8.30 am Geelong Railway Station
There is a short walk to the Aquarium from Spencer Street Station
The Deluxe Back of House Tour will be starting at 10.00 am

We will be doing a Deluxe Back of House Tour which also includes a Tour of the Front of House at the special rate of $15.00, discounted exclusively for our group. A Deluxe Back of House Tour is usually $17.00 per person on top of the rate we are being charged (Total $32.00). Any group members who have Student, Health Care or Seniors Card admission charges will be $11.00 and Children between the ages of 4 – 16 are $7.00.

Please let Claire Greenwell know if you wish to attend, we need to advise them of numbers a week before and make arrangements to be there on time. Phone 5243 7047

For more notices see pages 3, 13 & 14

OUT AND ABOUT

...Valda Dedman

Mt Gellibrand, west of Winchelsea, stands out above the surrounding plain. Perhaps its rounded cone was what lured Joseph Tice Gellibrand and George Brooks Legrew Hesse westward to their deaths. In February 1836 they set off from Geelong to look at the countryside. They were to follow the Barwon westwards to the Leigh and up that stream and then strike off eastwards to Melbourne with the You Yangs as a guiding landmark. However, they missed the junction of the two rivers and followed the Barwon southwards. They were never found, but search parties discovered new lands for squatters to pasture their flocks.

Mt Gellibrand is a volcanic cone, with a vent part way down. The last of the lava lies on the surface as giant, tumbled boulders, patterned all over with lichens, some velvety grey, others green and curly. Glassy brown or greenish olivine can be found in the basalt there, large irregular crystals that formed early within the magma. Four times as dense as water, they are difficult to scratch.

Two old pine trees dominate the basalt boulders, where a couple of hardy kangaroo apples and animal-pruned bursarias cling for life. This is sheep country and the native grasses have long since gone.

The nooks and crannies among the rocks make dark safe places for small animals to hide away in grass-lined nests. Until the mid-twentieth century Mt Gellibrand was home to a flourishing colony of Eastern Barred Bandicoots. Sometimes they were almost in plague proportions. The diary of Mr. V. Ramsay reveals that in 1903 rabbit trapping had to be abandoned on his property 'Turkeith' at Mt Gellibrand because so many bandicoots were springing the traps. In times of drought, they all but disappeared, but numbers always built up again and in 1941 he found thirteen 'both dead and alive' in the cellar. He sent three to the museum. In 1949 Brazenor collected fifteen specimens from Mt Gellibrand, but by 1977 the colony was extinct.

Many early settlers regarded bandicoots as fine eating, although there were certain disadvantages, as Mrs. L. Rawson pointed out in her *Australian Cook & Laundry book,* published in 1897. 'A bandicoot is a very disagreeable animal to clean, therefore it should be done as soon after killing as possible'.

Eastern Barred Bandicoots are now classified as threatened throughout Victoria. Many different pressures have contributed to their demise – loss of habitat, predation by foxes, dogs and cats, disease (cats spread toxioplasmosis), the effects of pesticides and the consolidation of the soil by stock on their invertebrate food supply.

Happily, the story does not end there. In the 1970s Eastern Barred Bandicoots turned up at the Hamilton tip, where they lived in old car bodies, but that population declined almost to extinction. A recovery program to save the species was put in place. Not always successful – some of those bred at Serendip died of snake bite and some of stress, and later the colony at Woodlands Historic Park north of Melbourne which had built up to more than 600 animals had crashed to zero by 1998, possibly because of drought and competition for habitat from 1200 Eastern Grey Kangaroos. The Melbourne Zoo has developed a captive breeding program. Protected populations behind fox-proof fences have been established at Woodlands and Hamilton, and several wild releases made in the Western District, including at the National Trust property 'Mooramong 'and at the Floating Islands Reserve, where 22 were released.

You can even join the Friends of the Eastern Barred Bandicoot (C/- RMB 8640 Hamilton 3300)

The Bandicoot is rather beaut,
Neat and clean,
No way a fool:
Like a rat that's been
To finishing school.

(Hepworth, J. (1983) Birds & Beasties Australian.

We know precious little about our Australian animals. So many of them, like the Eastern Barred Bandicoot, are nocturnal. How often do we even see the common ones, such as Brush-tailed Possums? We are more likely to curse them for being in the roof. Some of us saw bandicoots, when we visited the Hamilton tip on a cold and wet night of a GFNC campout in 1988. Have you ever heard of a ningaui or a boodie? How many local animals did we wipe out before we appreciated their uniqueness or even realised they existed? The wombats disappeared long ago. In 1995 there was a survey of the Southern Brown Bandicoot on the Bellarine Peninsula, but only one animal (probably a potoroo and not even a bandicoot!) was sighted, at St. Leonards, and a few possible diggings reported at Pt Lonsdale.

And... did you hear about the aliens that stopped the Ballarat train in the early hours of Good Friday? They were moving down across the track in vast numbers and the train wheels slipped and spun.

They were millipedes, those creatures which do not have 1000 legs, but which are known as Diplopoda because each body segment contains two pairs of legs. The introduced pests which stopped the train were the smelly ones that eat my strawberries, not one of the many native species.

Australian millipedes often live in leaf litter or under logs in moist forests, but the dwarf or pin-cushion millipede also occurs in semi-arid areas. Was it one of this type we once saw in on the move in their thousands at Welbeck Creek in central Queensland?

They looked like slaters with a fringe all round the edge. Some of our millipedes are tiny, under 1 cm long, some are more than 12 cm. Some are blind, some are hairy, some are brilliantly coloured with yellow or red patches, some spray you with formic acid when disturbed. The sad thing is, though, I probably have never seen most of them. Same old story of ignorance, but I will look more closely next time I'm out and about in the Otways.
No invertebrate survey has been carried out for CoGG as part of its biodiversity study.

Plant Group

...Dick Southcombe

Of the plants studied at our May Meeting, Weeping Grass *Microlaena stipoides* created the most interest especially when sections were examained under the microscope. This common perennial grass of southern and eastern Victoria, occurs in a wide variety of habitats. It is an important pasture plant in many regions, is extremely variable and exists as solitary tussocks, small colonies or natural lawns when grazed. The plant is quite decorative and the common names discribes its graceful habit. *Microlaena stipoides* is one of the best lawn grasses for shady sites and when regularly mown produces a fine sward with stems as short as a few centimetres supported by horizontal underground stems (rhizomes).

June Meeting
A session on Dissection. Please bring equipment, reference books and LARGE flowers which will hopefully enable identification of the floral elements.

Biodiversity Group

...Claire Greenwell

Only two unidentified specimens of fungi were presented... so the group looked at the yellow wings of a Grasshopper, tried identifying a moth that looked like the northern hemisphere common Silver Y *Plusia gamma. We* discussed Striped Marsh Frogs *Limnodynastes peroni,* and also the breeding of crickets for feeding frogs kept under licence!

PRESIDENT'S MESSAGE

...Diana Primrose

In accordance with our Constitutional guidelines, the minutes of meetings 'shall be available at all General Meetings for inspection by Members'. The Minutes File will be put out at meetings for interested Members to peruse, so please feel free to do this. (Just do not remove them from the official file please!)

Likewise the Membership Register 'shall be available for inspection by Members at a General Meeting'. As well as these two items, Members should have access to our Constitution. A copy will be available for inspection. We will try to organise a small table at meetings for these three items so that Members can peruse at leisure if they wish.

Members are reminded to sign the Attendance Book at all meetings and excursions. Leaders of meetings and excursions are responsible for seeing this is carried out in accordance with insurance requirements. Please see the President, or a Committee member, if you are a leader and unsure where the Attendance Book is kept.

The updated 'A Geelong Nature Guide' is now complete and ready for circulation. These are to be distributed to various local tourist information centres, libraries, community centres, etc to inform people of the range of interesting natural history areas they can enjoy in our locality. Hopefully this will increase the appreciation by the general public of our environmental assets and the need to preserve them. Please pick up some copies tonight, and if you can distribute some in your area it would be appreciated.

We are looking for one (or two) members who may be interested in representing the GFNC on two Committees, to deputise for our normal representatives if they are unable to attend. Dave King represents us on the Barwon Water Consultative Committee and Valda Dedman represents us on the Barwon River Users Group. Dave and Valda spoke of their roles on these Committees at our last members night (the April Meeting). The commitment of a deputy should not be onerous as it does not often happen that Dave and Valda are unable to be present. If you have an interest in these areas, have a talk with Dave and/or Valda to see what is involved - and please inform the President if you wish to take up this role.

Important Find at Jerringot

...Dave King & Valda Dedman

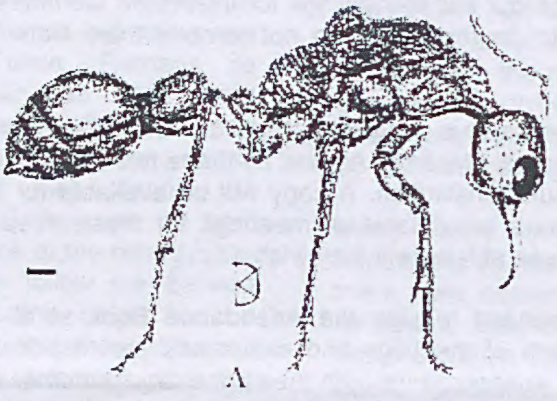
On the 8th May, 2002, a Waterwatch survey was conducted at the Jerringot Reserve. This involves not only the checking of the water for various physical and chemical conditions, but also the macro-invertebrate fauna as indicators of the aquatic health.

Amongst the invertebrate collection was a very lively small fish, which on closer inspection was found to be a Southern Pygmy Perch, *Nannoperca australis.*

This is a significant find, and confirms the suspected occurrence of this species in the Reserve. A severely damaged fish specimen, thought to be a Pygmy Perch, was collected during the Snipefest 2001.

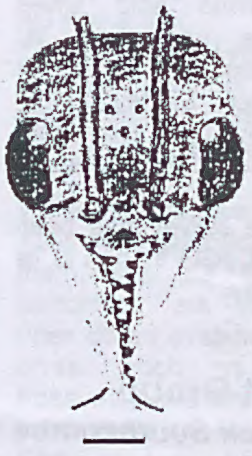
The Bull Ant – An Uninvited Guest

...Dave King
216/86 Church St. 3216



A

Scale bar 1mm



B

Introduction

A short while ago the writer was presented with a Bull Ant specimen by one of our members, Valda Dedman. It was apparently found in the lounge room walking over the carpet. This type of creature is not entirely welcome as a guest in anybody's home; and is fortunately, a somewhat rare occurrence. Bull Ants are infrequently found in urban areas. Their normal preference is to inhabit an open woodland type of environment, relatively moist, where disturbance is minimal and food sources readily available.

Examination of the specimen determined it to be a *Myrmecia brevinoda* (Hymenoptera, Myrmeciinae) a queen as indicated by the remnant wing stubs that suggest she had been fertilized during a recent mating flight.

How the ant came to be in the house cannot be positively determined, but likely it was transported with some vegetation from a rural source. Possibly at that stage the wings had been shed, and she would have been searching for a suitable site to establish a nest. Once selected, a small chamber is excavated and a small number of eggs produced. When hatched, the larvae are fed upon nutritive fluid derived from the reconstitution of now defunct wing muscles. The resulting nucleus of workers then go about developing the nest, whilst the queen continues the reproductive process (McKeown, 1942).

Description

The sub-family Myrmeciinae just contains one genus, constituting some one hundred species (Andersen, 1991). All but one species are endemic to Australia. The fossil record indicates that the Myrmeciinae are possibly the most primitive of all the ants. The fact that they feed mainly on fluids, such as honeydew, belies their fearsome appearance and aggressive nature. Capturing of invertebrate prey appears to be reserved for feeding of their larvae (Andersen, 1991).

Their general appearance is shown in illustration A. The waist typically is two segmented. The total length exceeds 20 mm, and colour overall is a reddish brown, the gaster darker than the trunk. Illustration B shows the facial features. The mandibles are diagnostically important, being as long as the head capsule and distinctly narrowed at their base. The mandible's outer edge has a concave contour. Teeth are relatively large, saw like and irregular. Three ocellus (simple eyes) are placed centrally on the frons or forehead. The labrum is rectangular and surmounted by a patch of hair reminiscent of a moustache. Overall the ant is hirsute; the mandibles in particular have coarse long hairs.

As is the case with all the Myrmeciinae, the apex of the gaster carries a sting of some malignancy, as those who have had the misfortune to be stung will testify.

In keeping with most, if not all Hymenoptera, the distal end of the foreleg tibia carries a strigil (L. strigilis, currycomb) for cleaning the antennae.

References

Andersen, A. N. (1991) *The Ants of Southern Australia*, CSIRO, East Melbourne.
McKeown, K.C. (1942) *Australian Insects*, RZS NSW, Sydney.

Bird of the Month

Darter

...Valda Dedman

Name Darter (Snake Bird) *Anhinga melanogaster*
Description Long necked diving bird. Male black with white neckstreak; chestnut throat and plumage streaks when breeding. Female streaky grey; throat and breast whitish.
Length 85-90 cm.
Voice Generally quiet, but harsh alarm *kar-kar-ka, kaka,* hisses and clicks.
Food Fish, some invertebrates
Habitat Open water, wetlands and streams with trees or logs on banks.
Range Throughout Australia where habitat exists.
Geelong Near Shannon Avenue bridge, Fyansford Common, Lake Merrimu, Exford Weir, Drysdale.
Breeding Whenever conditions are right – water levels and food available. Nests solitary or in small colonies, often among cormorants, ibises.
Nest Large rough platform of sticks, lined with leaves and built over water.
Eggs Usually 4, pale creamy green, chalky coat, 58x37 mm.

****

No, it's not a snake swimming. See, it has a bill. It's a Darter!

No, it's not a cormorant hanging its wings out to dry. It has a straight stiletto-like bill, the cormorant's is hooked. It's a Darter!

NO, it's not a pelican soaring. It looks like a narrow cross in the air. It's a Darter!

NO! It's not a cobra flattening its head, it's a Darter in courtship display.

The courting rituals of the Darter are amazing. The male selects the nest site and the female selects the male and then builds the nest with material brought to her by him. He decorates the nest-site with 4–11 fresh green leafy twigs, then advertises his ownership of it by wing-waving and twig-grasping. Wing-waving involves 'flashing' his silver-grey wing patches by raising and lowering his rotating wings, whilst stretching out his raised head and neck. Quite an impressive display, but he may need to grasp a nearby stick and shake it vigorously if the female circling overhead is not impressed. Seven males have been observed wing-waving at the same time.

Once the female has made up her mind, she approaches the male cautiously, hopping from branch to branch. Then she does her 'Snake Dance'. She moves her head back and forth horizontally, with bill open or closed. She moves closer to him, calling softly all the while. He does his Pointing act, head and neck stretched out and either held 20° above horizontal and waved slowly sideways, or held vertically up and flattened like a cobra. She sidles up to him and they rub their fully-extended necks together, then he gives a Snap-bow and she bows back. He may go off for a little fly before they come together for a bit of bill-nibbling. Sometimes he even puts his bill inside hers. They may then copulate, which only lasts 4–9 seconds but may take place several times during the first 2–8 days after pair-formation.

It's gone. It was there a moment ago. There's hardly a ripple on the water. The Darter is hunting below the surface. It sees a fish and the kinked neck suddenly straightens as, with slightly opened bill, it spears its prey. There are three elongated bones in its central neck, to which are attached downward-pulling muscles. This trigger-like hinge lets the bird thrust forward suddenly without dislocating its spine.

On coming out of the water, it shakes its head vigorously to detach the fish, which it then tosses in the air, catches and swallows head first. Large fish make take twenty minutes to be swallowed. Then, to avoid a chill, it has to spread its wings to dry, because its plumage is not waterproof – it actually absorbs water. The Darter has no preen gland to oil its feathers. It needs to be able to dive, not float.

Sometimes it uses the ends of its bill like forceps to pick off insects from plants or the water surface.

It has short legs, set well back for efficient swimming. When walking, it has to spread its legs for balance. All its four toes are webbed.

Roy Wheeler, in a study of the Darter in Southern Victoria (*Geelong Naturalist*, Nov. 1975) concluded that the Darter was an infrequent visitor. In 1914, Belcher had not seen any since 1892, then there were no more records until 1919, when a bird was shot in the Melbourne Botanic Gardens. In the 1950s Darters turned up in numbers along the Yarra River at Heidelberg and at the Yan Yean Reservoir. There was another resurgence about 1975. However, there were no breeding records further south than Creswick (1974–5) until Marilyn Hewish reported a nest with four young at Lake Merrimu in February 1989. In 1991 there were 11 active nests and the following year there were 16. Darters reappeared around this time in Geelong, at Balyang Sanctuary, and are now seen regularly near Shannon Avenue Bridge and at the junction of the Moorabool and Barwon rivers. The Geelong Bird Report 2000 plots their movements in our region. They are still somewhat uncertain and need further monitoring.

Report of the Illustrated Talk at the General Meeting on 7 May 2002 by David Taylor on the subject of 'NEW IDEAS ON VICTORIAN GEOLOGY'

...Roy Whiteside

The origin and functioning of the Earth

The Earth is basically an active machine which evolved some 5 billion years ago from a big cloud of gas after the Universe evolved. Our Sun was created as a result of a gas explosion. Heavy elements close to the centre of the Sun stayed behind and the lighter elements were blown away. This resulted in the formation of rocky planets close to the Sun with gaseous planets further away. The Earth is one of the rocky planets composed of heavy material which is mostly of iron and magnesium.

The Earth was once liquid and gravity forces pushed the denser elements towards the centre. The lighter materials, which now comprise the outer solid crust, remained on the outside. Beneath the 50 km crust is a very hot mantle and below this, the very high pressures have crushed the core into a solid iron ball. As the hot material comes close to the surface and cools down it results in a primitive material known as basalt.

About one hundred years ago the theory of **convection cells** was put forward. This effect can be likened to boiling a kettle. As the pressure decreases away from the Earth's centre, the iron is like a boiling hot liquid with convection cells of material that is circulating towards the surface and then returning towards the centre under gravity forces. The temperature below the Earth's crust is close to 1000 degrees Celsius. A temperature gradient exists from the Earth's centre to its crust, resulting in heat energy being radiated into space.

The Earth's Crust can be broken down into two basic types. The **oceanic crust** makes up about 78% of the Earth's surface area, with the **continental crust** making up the remaining surface area. The oceanic crust is denser and heavier and therefore sits lower and gets covered by water. The continental crust is a more differentiated material featuring the lighter elements. This crust projects further out from the Earth's centre than the oceanic crust. The Earth's crust is composed of a stack of **tectonic plates.** The molten material of the convection cells produces driving forces which over time drag these plates around and regions of the continental crust can collide with each other. The continents once fitted together like a jigsaw and have since drifted apart. Geographical maps show, for example, that South America and Africa fit together almost perfectly. The gap between these continents is still increasing and therefore the Atlantic oceanic plate between them is still increasing. The Pacific Ocean, which is much bigger than the Atlantic Ocean, has got to the stage where it is so hot that it is sinking down again with hot material underneath. This Pacific 'ring of fire' consists of hot material. As this material sinks down it takes water down with it. The resulting material underneath is forced to melt at a lower than normal temperature. This can give rise to volcanoes and earthquakes. Around the Atlantic plate, however, there are few earthquakes or active volcanoes.

Placing Victoria in the picture of the World

About 500 million years ago, Victoria was sitting on a plate margin but since then this margin has moved to New Zealand which is in an earthquake and volcanic zone. Today Australia can be considered dormant, as it exists in the middle of a plate and is not in a volcanic or major earthquake zone.

Some of the resources indicated by geological surveys include
Steel for cars, **fuel** from petroleum, **asphalt** from crushed rock for roads and **gold** which enabled a number of Victorian towns to be developed. A particular example is in Victoria in the town of Stawell where the wealth generated from a small gold mine is able to keep alive that whole area.

The work of the Geological Survey of Victoria (GSV)

This is now part of the Department of Natural Resources and Environment. Work has been carried out over the past 150 years. The name, GSV, has been retained in all that time despite the many changes to government departmental structures. The main work of the survey group is to study the rocks of Victoria. Maps and old reports together with more recent data are used to compile geological maps. For example, in the Grampians, a colour scheme shows the positions of the various layers of rocks and what type they are, e.g. sandstones and mudstones. Black lines represent folds and faults. With a little geological knowledge the shape of these layers can be worked out.

Today's technology makes the survey work much easier. Where there are no rocks on the surface, core samples can be taken to reveal details of rocks underneath the surface.

The **age** of rocks can be determined by measuring **radioactivity.** This method was discovered about 1900. Where

there is radioactive uranium, the age of a rock can be determined from measurements of the relative proportions of **uranium** and **lead** content. The method depends on the fact that, over a period of millions of years, uranium eventually breaks down into lead.

About one third of Victoria is covered in the Murray Basin with sands which have been formed in the last few million years. Most of the rocks in other areas are up to about 500 million years old. Modern methods use aircraft equipped with remote sensing equipment which measures **radioactivity** and **magnetism** of rocks on the ground with exact locations recorded by using GPS. There is a vast saving in time and effort compared with working from ground level.

A map showing natural **radioactivity** in the west of the state shows sheets of quartz beach sand which has no natural radioactivity which hides the other material underneath. Most granitic rocks are rich in radioactive elements.

A **magnetic** map shows the presence of some older rocks underneath the sand cover. A bunch of highly magnetic rocks, which previously had been undetected, have been detected in recent times. Previously core samples were taken by drilling down at various points to determine the nature of underground rocks. This procedure did not reveal details of the strata between the sampling points.

A further recent development in aerial survey work involves precise measurements of **gravity.** A dense rock like basalt, for instance, in western Victoria has more gravity pull than a lighter rock like granite.
By combining the three images of radioactivity, magnetism and gravity a comprehensive geological map can be compiled.

Victoria can be broken into a number of geological zones that are based on different types of rock and different ages. So we now have a **new geology map of Victoria** where we have basically stripped off the surface rocks. Victoria is basically oldest in the west and youngest in the east with a few exceptions.

A cross-section just north of Melbourne shows the nature of rocks in three dimensions. An illustration was given of an area near Heathcote where basalt material or greenstones were used by aborigines to make stone tools.

Seismic techniques, as used by the oil industry, present another tool for geological mapping. An example was given of a region just north of Hall's Gap in the Grampians. On the surface there is evidence of both old and young rocks where a big fault had been created. To assess what is happening below the surface a set of microphones is placed on the surface. Dynamite charges are set off and the microphones detect the reflected energy. The received sound energy information is processed by a computer that produces three-dimensional images, showing the positions of large underground faults and the various layers of rock.

An alternative seismic method of measurement is to use sensitive microphones to detect sound energy following an earthquake e.g. from China. This method is suitable for mapping to depths up to about 30 km. The received information depends on reflection and refraction of sounds as they pass through various layers and indicates which way the faults are dipping.

A time-space diagram can be created to show the **age** of rocks in Victoria versus **zone.** The ages vary from about 500 million to 350 million years old as one goes from west to east and indicate the movement of the plate margin as it moved to the edge of the Pacific Ocean. As we go across Victoria, zones are named in terms of the local region e.g. Grampians zone, Bendigo zone, Mallacoota zone, etc.

The formation of Victoria
Rocks were sitting on the edge of Australia before Victoria was formed. After a collision of tectonic plates in some regions the under-water rocks melted to form an oceanic rock with a special chemistry. In some regions granite was created.

Rocks were deformed by a collision between tectonic plates in west and east Victoria. A mountain belt was created as these plates got squashed up. Other deformations were effected by tectonic plate collisions from NSW and SA. Most of Victoria was still in the ocean at that time. As enormous amounts of material were eroded off, the ocean floor got covered in shale and mudstone with a covering of sandstone. This resulted in land replacing the sea. In some regions, as the oceanic crust was thrust upwards, it contained gold in quartz veins within the faults in the rocks. An example of this is revealed at Devil's Kitchen in the Ballarat area.

A vote of thanks was given by Graeme Tribe

Bound for South Australia

...Ray Baverstock
13 Helena Street, Highton, 3216

For several years members of our family have been making a springtime journey to Adelaide to visit my wife Lena's elderly aunt. Road safety authorities are always urging travellers to take frequent breaks, and this is very important if there is only one driver. Over the years we have picked out our favourite spots and I would like to share some of these with you. Three of them have particular interest for Field Naturalists. Unfortunately we can only stop at each place for a short while.

We usually have morning tea at Horsham where there is a nice park and toilets on the Adelaide side of town. The highway now bypasses Dimboola which is a good place to stay for a holiday. Many years ago Lena and I stayed at a motel there and used this as a base to explore the Little Desert National Park, Wyperfeld National Park, Mount Arapiles, Wail Nursery and Arboretum and other nearby areas. A week or so later, Grant and I returned, stayed at the local caravan park and explored the same areas. The new bypass road is a good place to see Black Kites.

We usually have lunch at Nhill, the half way point to Adelaide. On the left hand side on the way out is a picnic area complete with toilets, a long wavy slide for the children and picnic tables under shelter. If you eat here, you will probably be joined by a pair of Noisy Miners waiting patiently on the ground for any crumbs left over.

But the main attraction here and our first natural place, is the Nhill Swamp! At the end of the boardwalk is a bird hide. Before the end, the boardwalk has a branch off to the left leading to the walking track around Nhill Lake.

In recent years the swamp has been mainly dry, but about three years ago there were a few puddles and we were able to look down on some Green and Golden Bell Frogs and could hear hundreds calling in the distance. When we reached the lake the noise of the frogs was deafening!

Imagine our dismay when we called a year later to find that the lake had been 'improved', it had been dredged to form an island at the northern end. All we could see was muddy water and three or four Red-necked Avocets at the base of the island and no sign of any frogs at all. Meanwhile back at the swamp, Rufous Songlarks were everywhere. It is only a short distance to Wimpy's Little Desert Lodge, another good place to stay.

For some reason we didn't make the trip in 2001, but in January this year we were on our way to Adelaide again for a different reason. Aunty Margaret, a gracious, much loved lady, had passed peacefully away at the age of 103, and we were going to attend her funeral.

At Stawell there was carnage on the road. A large flock of Sulphur Crested Cockatoos was still milling around despite a large number of them lying dead on and beside the road, obviously having been hit by a large vehicle.

Again we called in at Nhill. The swamp was still dry but the water quality in the lake had improved greatly. We were able to see a number of Grebes, and a Darter was also seen feeding. Still no frogs.

Near a seat halfway along the boardwalk, is an ancient River Red Gum. A number of Red-rumped Parrots and two or three immature Eastern Rosellas were seen here. Since our last visit a large number of nest boxes have been erected in the trees in the swamp, however Grant was a little disappointed that there did not seem to be any bat boxes.

Birds observed at the lake and swamp were: Australasian Grebe, Hoary-headed Grebe, Musk Lorikeet, Purple-crowned Lorikeet, Rainbow Lorikeet, Red-rumped Parrot, Eastern Rosella, Masked Lapwing, White-plumed Honeyeater, Willie Wagtail, Goldfinch, House Sparrow, Noisy Miner, Striated Pardalote, and Darter.

I would like to see Nhill Swamp when it is full, and can only imagine the bird life then.

Travelling on, at Boardertown near the highway, is an enclosure with a number of white Kangaroos, and in an adjoining enclosure are some Emus. It is rather sad to see Kangaroos enclosed like this, but it is doubtful if they would last long in the wild.

Keith is another town where we have stopped for lunch. There are several picnic areas beside the highway, one of which has a trolly on rails. A word of warning. Once the kids get on this, you will have a job getting them off again.

If you are travelling with a dog, a good place to stop is Coonalpyn. Next to a small picnic area beside the road is a pedestrian underpass beneath the railway lines. This leads to a small fenced off exercise area where you can let your dog do what a dog has to do. The underpass itself has been converted by the locals into what they call a 'Tunnel Vision'. Here a large number of murals have been attached to the walls, depicting the life of individuals and organisations in this rural community.

We usually travel from here, right through to Adelaide. The new Freeway and Tunnel have made this part of the journey safer, although not entirely fatality free. After our stay in Adelaide, we call in at the other two natural places on the way home. The first of these is not well signposted, but is approximately 5 km north of Keith.

For much of the journey the road runs beside the railway line, but here the road skirts a large dune leaving several hectares of

Broombrush Mallee country called the Kelvin Powie Conservation Park. From the circular car park, one track leads back in the direction of the road. A few years ago Grant saw a Southern Scrub Robin here – I have not been so lucky. This time we also took the track to the left. Wire netting has been laid on the track to reduce the impact of foot traffic. Ducking under the limb of a Gum tree on which a beautiful little nest had been made, we climbed up the slope. Old railway sleepers have been used to make steps near the top of the dune. Here one gets a good view of the Park and the surrounding country.

Birds observed here were Tree Martin, Welcome Swallow, Common Bronzewing, Brown Falcon, Weebill, Silvereye, New Holland Honeyeater, Brown-headed Honeyeater, White-plumed Honeyeater, Grey Shrike-thrush, Little Raven and Common Starling.

I believe that several hours could be spent in the Park studying the plants, birds and other animals.

The third area is the Little Desert National Park. A road to the right just east of Kiata takes you there. A gravel track to the left leads to the camping and picnic ground complete with tables, fireplaces, etc.

If you continue on the bitumen road, you come to a smaller picnic area where there is a shelter and a nature trail. Being a very hot day Grant and I only walked as far as the Mallee Fowl Mound. The brochure said that after a number of years the mound had been used again. However, we could see no evidence of this. In the short time we were there we saw: Rock Dove, White-winged Chough, Galah, Australian Wood Duck, Laughing Kookaburra, Brown-headed Honeyeater, Supurb Fairy-wren, Rufous Whistler, Striated Pardalote, Weebill and a flock of 6 Emus.

On the way home, we left the highway at Beaufort and travelled via Skipton and Rokewood. Lake Goldsmith was completely dry and the only birds of note were 2 Yellow-tailed Black-Cockatoos near the Linton turnoff and a large flock of Little Corellas.

Happy travelling!

[Den and I travel regularly to Adelaide and beyond, and Ray's descriptions evoked quite a few fond memories of my own!

We were camping at Rainbow about 10 years ago and got up at 4.00 am to go to Wyperfeld National Park to see that the male Mallee Fowl had finished working his mound. He had opened it up to allow some heat to disperse from the rotting vegetation that was incubating his lady friend's eggs after, no doubt, testing the heat with his tongue and was just vanishing into the bush!

On our way home, we called in to the Little Desert National Park, to the picnic ground with the mound as described by Ray, and as we walked past the mound we almost fell over 2 Mallee Fowl! They were in no hurry to move away from us, and we stood spell-bound! Probably trained to entertain tourists, we said, to go with our observation about the scrapings on the mound, done by the rangers? Obviously not!

In recent years we have been going the other way to Adelaide, via Hamilton, Penola, Naracoorte and Keith, then on the Dukes Highway and it isn't very much longer.

Wannon Falls on the western side of Hamilton has a picnic area just inside the gate with shelter and toilets as well as another one further into the park at the falls themselves. The cantilevered viewing platform is new and gives a fantastic view!

At Naracoorte are the wonderful limestone caves. One cave is a nursery for Bent-wing Bats which come out at dusk to feed – what a site! Worth staying a couple of days.

Continuing along this road to about 20 km(?) before Keith, is an outcrop of rock called Christmas Rocks. There is a picnic table but no toilets. The wild flowers in spring were something to behold, and plenty of bird life.

Some times we go from Penola via Millicent to Beachport and Robe. Not far after turning onto the Robe Road near Beachport, Woakwine is a cutting through solid limestone rock to drain 'a mosquito infested swamp' which turned it into valuable agricultural land. The geology is interesting, that's all I can say about that!

On a very corrugated gravel road between Beachport and Robe, via Nora Creina, is Little Dip Conservation Park. The Lakes along here are the remnants of the southern end of the Coorong.

The Coorong and the Younghusband Peninsula have terrific Pelican rookeries. The first time we saw a flock of 65 soaring overhead, it attracted our attention causing as to stay a couple of days at Policeman's Point.

September last year, we travelled to Adelaide via Swan Hill staying in a cabin at the Caravan Park on Pental Island. Great birding along the Murray River as always.

On the right about 1 km before the SA border, there is an area of typical mallee bushland. It is a good spot to stop and consume the last of your fruit and vegetables before crossing the SA border and running into the fruit fly inspectors 10 km the other side! (Two years ago I peeled 5 kg of potatoes rather than throw them away!)

We stayed for a few more days at Renmark where there are quite a few conservation parks and well worth visiting.

Lake Bonney at Barmera is a pleasant stop. Donald Campbell did his speedboat trials on this lake in the 1950s. The area has been declared a Bookmark Biosphere, preserving the natural heritage. Nearby Overland Corner has an historic old pub which serves great steaks! Nice grounds on the river bank here to watch birds, too.

Some kilometres after Barmera, Banrock Station winery and environmental centre is also a must to spend time and wander.

Down on the Dukes Highway again at Murray Bridge, on the left hand side just over the river, is a wetland with a bird hide that we have yet to investigate.

Claire Greenwell]

Annual General Meeting 2 April 2002

REPORTS FROM THREE CLUB MEMBERS INVOLVED WITH COMMITTEES IN THE GEELONG REGION

(continued from last month)

...Roy Whiteside

(Part 2)
DAVE KING

BARWON WATER CONSULTATIVE COMMITTEE

This group has been running for about 18 months and has dealt with a number of features that have been brought up by Barwon Water. The main reason for the formation of this committee was to discuss any problems with the development and works which involved Barwon Water. The committee is composed of representatives from GFNC (Dave), GEC, Farmer's Federation, and officers from Barwon Water.

Some of the major problems:

The Airey's Inlet Sewage Treatment Plant

This had been built by another organisation which Barwon Water took over as a going concern. Sewage is treated in lagoons and then recycled through tree plantations which are operated by Midway. Dave noted that when he first visited the site, water was nearly flowing over the top of a retaining wall and with wind it would have flowed into Painkalac Creek resulting in pollution and erosion. Fortunately soon after that time, there was a drought and the water was used to irrigate the tree plantations. It was later discovered that there was a serious leak in the sewer main which was dragging in ground water. This problem was brought under control but the system was getting near to the limit of its capacity to use the water obtained from this sewerage system. There are 20 hectares of blue gum plantations, but the clay soil does not absorb or percolate the water where it is irrigated. Another 10 hectares which is within the jurisdiction of Barwon Water is still covered in native vegetation and it was proposed to clear that area and replace it with plantations. The proposal was considered by the committee and was opposed by the GEC. Another solution would be to take a pipeline from Airey's Inlet to the Anglesea sewerage plant, which does some initial processing and then discharges into the ocean. The scheme would be adequate up to the year 2018 but another problem would arise at that stage unless there was a reduction in the development in Airey's Inlet area and by ensuring that every house has a dual flush toilet or even composting toilets. It is not very acceptable to increase the plantation area at the expense of native bush. A telemetry system to Geelong enables remote control of the sewerage plant from the Geelong office.

Barwon Downs Ground Water

During the recent drought period a lot of water has been pumped from ground water in the bore area of Barwon Downs to supplement Geelong's water supplies. Problems have occurred because the ground water level has diminished with little recharge over the drought period. Breakfast Creek dried up causing a loss of vegetation and water creatures, including platypuses. Local farmers have lost water through their bores not being deep enough to cope with the drop in water level. Barwon Water has been working on a quota for the water and another bore is being looked at further to the east. This an engineering question which is not within the realms of the Committee.

Bio-solids Management at the Black Rock Sewerage Facility

The bio-solids are now being shipped by truck to the Werribee Sewerage System as the space in the lagoons has been exhausted. There has been a problem with odours particularly after rain. This system can continue for another two or three years before the space available is exhausted. Much engineering work is required to create further lagoons. Another way of dealing with the solids would be to have a huge worm farm, a system being used in Sydney.

Logging in Water Catchments

The Committee has sent a message to the BW board saying that it has misgivings about logging in catchment areas.

Anakie Water Supply presents some problems. This has now been averted by decommissioning the aqueduct to Stony Creek Reservoir and the Upper Stony Creek Dam has been de-commissione. Environmental flows were required in Stony Creek as well as in the tributary to Stony Creek which is being fed by a leak from the aqueduct resulting in a wetland. A valve is being constructed at the dam to control water out of the dam into the Stony Creek.

Barwon Sewer Aqueduct Bridge

This is a heritage and engineering issue which is not very relevant to field naturalists.

Ocean Grove Sewer Transfer Main

A larger sewer main is to be constructed along the water-front at the top of the beach. This will require removal of a certain amount of vegetation but this will be replaced after the main is installed. The Barwon Heads bridge currently carries the sewage to Black Rock. Another bridge is to be built across the Barwon together with another sewage pipe.

BELLARINE RAIL TRAIL

Implementation has been complete for some months now from S Geelong all the way to the Queenscliff Quay on the old rail track. The rail trail in the Geelong

section is part of the trail around Port Phillip Bay which links with the Queenscliff to Sorrento ferries. The Geelong section ends at Little River. At present the trail has reached Lara. The next section to Little River will be completed once the highway updating has been completed. The Metropolitan Board will then connect from there to the Mornington Peninsula to finish at Sorrento. Dave lobbied for a connection between Breakwater and S. Geelong via the Warrnambool rail track reserve. That has been agreed and funds have been allocated. This will give another connection between the Barwon River tracks, the Waurn Ponds tracks and the connection to Queenscliff.

(Part 3)
VALDA DEDMAN

BARWON RIVER USER'S GROUP

This group started in 1996 under the authority of Barwon Water and its role was to provide a direct link between that authority and the users of the Barwon River. The group is now under the authority of the Corangamite Catchment Management Authority together with Barwon Water. The basic aims of the group are

1. To be responsive to consumer needs and concerns.
2. To provide access to valuable community/local knowledge and resources in managing the Barwon River through Geelong.
3. To represent community views in relation to the management of the Barwon River in Geelong.
4. Giving advice on aspects of service levels and facilities provided on and along the river and environs.
5. To provide a mechanism by which Barwon Water can understand the problems, issues and possible solutions from the perspective of various Barwon River users.
6. To investigate and promote greater involvement of river user groups in the provision and maintenance of recreational facilities
7. To provide a forum to discuss co-ordination of events along the river environment and
8. To assist in identifying and securing external resources to undertake projects.

The committee was set up under the chairmanship of Priscilla Pescott (former member of Barwon Water Board) with meetings held quarterly. It has representatives from rowing, canoeing, water skiing and fishing.

Activities occurring on reserves adjoining the river include running, walking and cycling. Valda is the current GFNC representative who advises on conservation concerns but would welcome a younger person to take over from her in the future. If Valda is unable to attend a meeting her place can be filled by a substitute representative from GFNC.

There are usually representatives from CCMA and from Barwon Water as this latter group is responsible for water and sewerage provision and it is also under contract to look after the river and the banks through urban Geelong. Each committee representative has a particular role to play with Valda representing 'the river' as it has no one else to speak on its behalf!

The user groups get substantial financial help e.g. landing stages are built, trees are planted for them, they get help with the staging of events and with clearing up of rubbish afterwards.

The water skiing organisation is somewhat more responsible as they do not get to use all of the river all of the time and only over a restricted region i.e. upstream of the Moorabool St. Bridge. River officers are provided to regulate the water skiing.

There is a by-law about the use of the river e.g. you cannot use a boat in the river without a permit and regulations are stated at the landing stages. Swimming is prohibited when water skiing is occurring.

The committee discusses issues and is told what is happening. For instance the bird hide at Yollinko is being rebuilt and there is an upgrade of the river by dredging in order to deepen the water at the rowing course so that the school-girls rowing events could stay in Geelong.

The Head of the River for boys needed a 2000 metre course whereas the girls use 1600 metres. It was found that there were low levels of arsenic in the dredged material which had originated from wool-scouring.

Valda's role was to ask about macro-invertebrates in the river. She hopes there will be more monitoring from now on. There are reports on blue-green algae which has been of some concern for the water-skiers when the river has been closed for use.

The canoe club was concerned about possums in their canoes. The committee learns about illegal discharges into the river and what is done about them. It also learns about the calendar of rowing and canoeing events and the river cruise boat which is not running at present.

BARWON RIVER LAND USE AND OPEN SPACE CORRIDOR PLAN REFERENCE GROUP

This covers the region from Ceres to Barwon Heads with particular reference to Fyansford Common and the north bank of the rowing course. It also considers Belmont Common including the region known as 'the island' close to the area where circuses are held.

Diana Primrose thanked the members for there reports and for their participation with these committees.

EXCURSION TO LAKE CORANGAMITE AND STONY RISES
With Colac Society for Growing Australian Plants (SGAP)
19 May 2002

...Reports by John James and Joe Hubbard

Leaders Geoff Beilby and Joe Hubbard led us out past Alvie Primary School with its wonderful wetland area, and Dreeite to Woods Lane Lake Frontage Reserve on the eastern bank of Lake Corangamite, Australia's largest permanent inland salt lake (Lake Eyre is not permanent).

Woods Lane is sign posted, but it really needs a sign saying Lake Frontage Reserve. It is important because most of the foreshore of Lake Corangamite is privately owned, and fenced. Tree planting was carried out by the Department of Natural Recourses and Environment about 12 years ago and includes melaleuca and acacia species.

The level of water in the lake is quite low as this district has had low rainfall during the past 6 years.

On the wide expanse of 'beach' composed mainly of pink Coxiella shells and beautiful lichen-covered rocks, we saw Button immortelle *Leptorhynchos waitzia,* Ruby Saltbush *Enchylaena tomentosa,* Pink Bindweed *Convolvulus erubescens,* Senecio species, both native Pelargonium and native Geranium, Camadian Fleablane *Conyza canadensis* (a very nasty weed) and Creeping Myoporum *Myoporum parvifolium;* in fresh water seeps, Button Sedge, Kidney Weed *Dicondra repens,* Australian Salt Grass *Distichlis distichophylla,* Bearded Glasswort *Sarcocornia quinqueflora,* Austral Seablite *Suaeda australis,* Glaucous Goosefoot *Chenopodium glaucum,* Common Blown-grass *Agrostis avenacea;* and the beautiful red Dodder was feeding on the poor little Wilsonia. The Dodder was flowering, but we had to lie down on the 'sand' and use a hand lens to admire the flowers. We did not see the Golden Dodder, but it has been photographed in the area.

We climbed back up the bank to have our lunch and found the Austral Hollyhock *Lavatera plebeia* growing just above the high water mark of 1956. Also here we found the introduced Tall Wheat-grass *Lophopyrum elongatum.*

English Skylarks were calling constantly overhead and a Nankeen Kestrel put on an aerial display for us. Through the telescope we could see thousands of Banded Stilts, and small flocks of Curlew Sandpipers and Red-necked Stints at the water's edge.

After lunch we headed south for the Wool Wool Rocks where the Pelicans build their nests, passing an isolated stand of Red Gums *Eucalyptus camaldulensis* near the South Dreeite Tennis Courts and Fire Shed. At Wool Wool we saw *Clematis microphylla* and Tree Violet *Hymenthera dentata.*

Further south we stopped briefly on the south east shore at the abandoned site of the Aquatic Sports Centre. This was one of the sites of the World Limnological Society's Conference which was held at Lorne.

Then down Nalangil Road to the Floating Islands to see a lone Koala, and two ferns growing among rocks, Rock Fern *Cheilanthes austrotenuifolia* and Sickle Fern *Pellaea falcata.*

We then drove a short distance to see the tree planting site where, about 20 years ago, Colac Otway SGAP planted an area with Manna and Swamp Gum, Blackwood, *Leptospermum continentale* and *Melaleuca squarrosa.*

Here, among the dry stone walls, we found a Tree Violet with berries and an introduced Elderberry.

John James

John forwarded his excursion notes which I was pleased to use as the excursion report. If I could quote John: 'I set out to just write a list of plants as requested but got carried away!' You know John, I suffer from the same addiction.

I was carried away by the beauty of the fringing saltmarsh with intense colouring, dusky red to pink, the spectacle of thousands of waders on the mudflats, and for a few moments the passing by of a Peregrine Falcon, then the by-play of Nankeen Kestrel and Black-shouldered Kite. But I must stop before...

We were fortunate to have a leader as knowledgeable and personable as Geoff Beilby. He made the day!

For me, being in the company of like-minded and agreeable people is always a pleasure. Thankyou for your support!

Joe Hubbard

Mid-week Bird Group Excursion Report, 16 May, 2002

Eynesbury

...Brian Hart

A fresh, cool wind with showery conditions was forecast but despite this 11 members turned up. The excursion was led by Peter Bright.

First stop was Melton Reservoir – few waterbirds, though two darters were seen. There were bush birds in the vegetation in the carpark area, including Crested Pigeons, Long-billed Corella, Eastern Rosella, Red-rumped Parrot, Suberb Fairy-wren, Red-browed Finch, Australian and Little Raven. We also saw four raptors – Black-shouldered Kite, Brown Goshawk, Brown Falcon and Nankeen Kestrel.

We then moved on to Eynesbury, a private property. Rohan Bugg had obtained permission for our visit from the owners.

Once in the property there is an extensive (100 – 200 ha?) area of tall open Grey Box woodland, with grassy ground cover and sparse understorey – mainly *Acacia acinacea*. This was the area we were interested in.

As the Grey Box wasn't in flower there were few honeyeaters about but there was quite a good selection of other bush birds.

The highlights were – Speckled Warbler, Diamond Firetails, Pink Robin, Jacky Winter, Flame Robins, Little Eagle, Varied Sitellas, and one Olive-backed Oriole (rather late in the season). Others included Galah, Crimson and Eastern Rosella, many Red-rumped Parrots and Brown Treecreepers, Spotted Pardalote, Buff-rumped, Yellow-rumped and Yellow Thornbills, Tree Martin and Silvereyes. Of the Honeyeaters, White-plumed were the most common, though not numerous, one small flock of Red Wattlebirds was seen Brown-headed Honeyeaters were heard calling a couple of times.

The visit concluded with a picnic lunch. However, for Kay, lunch was rather traumatically delayed. After ranging over a lot of ground on foot, she had almost arrived back at the cars when she discovered she'd lost her car keys. PANIC! After backtracking to a loo stop and all sorts of contingency plans being made – all of a sudden she found the keys! A hole in her trouser pocket had let them fall down to be caught in the bottom of the leg just above her boot.

Rain started to fall – we piled into cars and returned to the shelter shed at Melton Reservoir for a bird call.

The total species for Eyensbury was 48 and 30 for the Reservoir.

NEXT MID-WEEK BIRD GROUP EXCURSION

Thursday 20 June, 2002
Blue Circle Southern Cement
Waurn Ponds

Leader Pat Streefkerk.
Following on from our initial survey of areas leased by Blue Circle 12 months ago, we will be surveying the same areas again. Pat Streefkerk, who knows the area well and who, with husband Hans, is a member of the Community Liaison Committee, has agreed to act as leader, but says she needs lots of help with the birds.

Meet at **8.30 am** at Waurn Ponds Shopping Centre behind the Green Grub Nursery **or** at the corner of Anglesea Road and Whites Road (first on the left after crossing the railway line) at 8.50 am.
Bring morning tea.
Finish about midday.

Enquiries: Pat Streefkerk 5264 5235 or Polly Cutcliffe 5244 0182

July Mid-week Excursion

Changed to first Thursday, 4 July.
To create an opportunity for those who can only attend in the **school holidays**, the July excursion has been brought forward to the first Thursday. This will be to the Ocean Grove Nature Reserve.
Leader: Brian Hart.
Enquiries: Polly Cutcliffe 5244 0182

BIRD GROUP REPORT
21 May 2002

...Trevor Pescott

At the May meeting, Craig Morley continued his 'Birds Inside Out' series.

The story so far has covered how birds make vocal sounds, fly, their respiratory, circulatory, reproductive, digestive and excretory systems. So what next ... of course – thermoregulation.

Birds need to maintain a body temperature of between 40-44 degrees C which is higher than that of similarly-sized mammals.
To maintain this temperature range, birds must strike a balance between heat gain and heat loss ... or *thermoregulate*.

Increased body temperature allows nerve impulses to travel faster and muscle strength increase, thus greatly extending the bird's ability to complete highly aerobic activities such as long distance migration.

Two components in the bird's body, vital in maintaining the higher body temperature, are the respiratory system and the heart.

Bird lungs have a denser spongy tissue connected to air-sacs that occupy up to 20% of the body cavity and their nostrils filter dry, warm air very efficiently into the lungs.

Birds have larger hearts than similar-sized mammals, four-chambered with better draining ventricles to improve blood flow.

But there's a draw-back – birds have extraordinarily high blood pressure making them susceptible to heart failure at times of high stress!

For birds to maintain high body temperatures, they need to be able to metabolise food into heat energy quickly.

High body temperatures mean birds can forage earlier and later in the day, giving them an 'edge' over their prey, early birds and worms!

The basal metabolic rate occurs when birds are at rest, but during daily activities, the rate increases up to four times, while in flight it is 10 times higher.

Avian flight is highly economical in energy use terms – a songbird flying one kilometre uses less than 1% of that used by a mouse covering the same distance.

To maintain a stable body temperature, heat production and loss must be in balance. It is more difficult for small birds to retain heat than it is for larger birds.

For birds to lower body heat, they become less active in the heat of the day, seek shady places, bathe, or soar at high altitudes where air is cooler.

Zebra Finches will partly spread their wings to allow heat radiation from the sparsely-feathered under-wings, while incubating plovers turn their backs to the wind to allow cool air to break the insulating layer of feathers.

Birds lack sweat glands but they can cool down by moisture loss (perspire) through the skin, and by panting which causes evaporation of moisture from the air sacs.

Cormorants and pelicans undertake 'gular-fluttering', rapidly vibrating the bare throat skin to evaporate moisture and hence cool down.

Evaporative cooling rarely dissipates more than 50% of the excess heat, so tropical species can lower their metabolic rate as much as 30% below that of similar birds in temperate climates.

In cold weather, birds must maintain body heat. Feathers are better heat insulators than mammal hair, and to increase the insulating quality birds fluff-out their feathers to capture more air which enhances the insulation.

When resting, birds will tuck their heads into their feathers to minimise heat loss through the bare facial skin. Shivering pectoralis muscles generates body heat too.

Some birds, e.g. Wood Swallows, cluster together to share body warmth, alpine species may bury themselves in snow (to avoid cold winds), others sun bathe when there is sunshine, or roost in dense foliage, brush piles or tree hollows... all to conserve body heat.

Many species gain denser plumage in winter.

One important consideration is to minimise heat loss through exposed legs and feet. This is achieved by a reduction in artery diameter to reduce blood flow, or by transferring heat in arteries to cooler blood in adjacent veins.

Another strategy is to allow the body temperature to drop, particularly on cold nights or when food is scarce. Under these conditions, the bird may go into a state of torpor, but probably not true hibernation as some mammals do.

Some northern hemisphere Nightjars are said to hibernate, while Sand Martins have been noted huddling together during a four-day storm.

During this time, the Martins' body temperature dropped to 8^{0}C saving 62% of their metabolic costs.

In summary–
Thermoregulation is the balancing of body heat loss and heat gain: it enables birds to occupy a wide range of habitats and it is attained through a wide variety of activites.

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Footnote
The day after Craig Morley's talk, Israeli scientists released pictures of their featherless chickens. The main problem these birds have is sunburn!

Next Bird Group meeting –
18 June, Susan Meyers will speak about Malaysian Birds.

BIRD OBSERVATIONS FOR MAY 2002

... compiled by Rob Ganly and Marilyn Hewish

The birds in the Geelong region seem to be just as confused about the seasons as we are. Many spring-summer migrants have stayed unusually late in the season, probably because of the unusually mild autumn. Sharp-tailed Sandpipers, Little Terns, Bronze-Cuckoos, Olive-backed Orioles and Dusky Woodswallows were all present into late April and May. At the same time, Red Wattlebirds, Yellow-faced Honeyeaters and Mistletoebirds have begun their autumn movements and flocking, and winter migrants and birds which visit woodlands, open country and suburbia in autumn and winter have already moved in. Cattle Egrets, Grey Goshawks, Eastern Spinebills, Flame Robins and Pink Robins have all been recorded recently. This is certainly the time to be out bird-watching, when you can see birds of all seasons at once. As if we needed further incentive, there has also been a stream of records of rare and unusual birds since last spring. Peter Bright's personal Freckled Ducks have stayed at Lake Lorne for some months now. The secret for superb viewing is to arrive before sunset, when the birds emerge from the islands and concealing willows, and feed in open water. If you are lucky, they roost on the shore metres from the car (I am indebted to Rob Mackenzie for this hint). Spotless Crakes, Black Kites and Spotted Harriers are supposedly rare visitors to our region. Well, maybe not so rare recently - look back over the records for 2001 and 2002! A single immature Red-capped Robin at Stony Creek picnic ground consorted with a brown Pink Robin and a Scarlet Robin (just to confuse us, I'm sure). Fuscous Honeyeaters, rare winter visitors to our region, are all through the Brisbane Ranges at the moment. The news is that there is little eucalypt blossom north of the Divide and nectar-feeding birds have been driven south. This winter it would be worth having a careful look in any flowering eucalypts. Fuscous Honeyeaters could be your reward, and maybe Swift Parrots if you are very fortunate.

This is a selection of records from those submitted at the May Bird Group meeting. Remember that birds don't need to be rare to be interesting, and all records, spectacular or not, are of value for the Bird Report. It is especially encouraging to see good observations of behaviour for our more familiar birds (for example, the Pink-eared Duck record). Thank you all.

The observers were: AW, Alison Watson; BAt, Bryant Attwood; BSt, Bill Stent; DHe, Dean Hewish; GB, Grant Baverstock; GMc, Gordon McCarthy; JB, John Bottomley; JCa, Jocelyn Calvert; JH, Joe Hubbard; JN, John Newman; LP, Lorraine Preston; LS, Lily Sherwood; MAC, Margaret Cameron; MHe, Marilyn Hewish; PFl, Pauline Fletcher; PhW, Phil Watson; RBa, Ray Baverstock; RGa, Rob Ganly; RP, Rob Preston; TFl, Tom Fletcher.

Species	Number	Date	Comments	Observer
Freckled Duck	230-250	24/4/02	Lake Lorne, roosting on south shore at sunset.	MHe
Australasian Shoveler	1	1/5/02	You Yangs, Barros Pit wetlands.	JH
	230	3/5/02	Freshwater Lake. Numbers have built up from 2 in Jan.	MHe
Chestnut Teal	4	13/4/02	Jerringot.	RBa
	2500	3/5/02	Lake Victoria.	MHe
Pink-eared Duck	2	17/4/02	Lake Lorne. Swimming together in tight circles in shallows, possibly stirring up sediment for feeding.	LS, LP, RP
Australasian Gannet	5	21/5/02	Point Henry. One immature.	RGa
Cattle Egret	45	29/4/02	Jerringot.	GMc
Australasian Bittern	1	21/4/02	Reedy Lake.	GFNC
Glossy Ibis	14	21/4/02	Reedy Lake.	MAC, GFNC
Straw-necked Ibis	2500+	8/5/02	Drysdales Road, You Yangs.	MHe, BSt
Royal Spoonbill	2	13/4/02	Balyang Sanctuary.	RBa
Yellow-billed Spoonbill	2	13/4/02	Balyang Sanctuary, feeding with the Royal Spoonbills.	RBa
Spotless Crake	1	3/5/02	Freshwater Lake.	MHe
	1	8/5/02	Point Henry, eastern end Windmill Rd.	RGa
Black-shouldered Kite	2	20/4/02	Reedy Lake, nesting; still on nest on 19/5.	BAt
Black Kite	1	24/3/02	Anglesea.	GB
	2	10/4/02	Murgheboluc.	GB
	1	4/5/02	Serendip.	GMc

...continued on page 16

Species	Number	Date	Comment	Observer
White-bellied Sea-Eagle	1	21/4/02	Point Henry. First seen here since 1984.	GFNC
	2	14/5/02	Point Henry.	RGa
Spotted Harrier	1	18/5/02	Lethbridge. Tall Tree Road, perched on fence.	RBa , GB
Grey Goshawk	1	6/5/02	Jerringot.	BAt
Wedge-tailed Eagle	2	17/4/02	Ocean Grove–Lake Connewarre area.	LS, LP, RP
Australian Hobby	1	3/5/02	Torquay Front Beach.	RBa
Painted Button-quail	1	7/5/02	Long Forest; crouched on bitumen road, rocking back and forth.	MHe
Ruddy Turnstone	2	10/5/02	Point Lillias.	GMc, RGa
Red Knot	7	3/5/02	Lake Victoria	MHe
Sharp-tailed Sandpiper	20+	21/4/02	Reedy Lake; usually gone by this date.	GFNC
Banded Stilt	260	30/4/02	Lake Victoria.	GMc
Hooded Plover	6	11/5/02	Hutt Gully.	AW, PhW
	2	13/5/02	Black Rocks.	TFI, PFI
Pacific Gull	6	2/5/02	Torquay Front Beach. 5 immature.	RBa
Little Tern	7	3/5/02	Lake Victoria. Resting on rock outcrop, in full breeding plumage.	MHe
Common Bronzewing	1	28/4/02	Bacchus Marsh. In garden; first record for town.	DHe, MHe
	1	18/5/02	Newtown.	JH
Crested Pigeon	6	17/4/02	Lara.	JH
Little Corella	6	24/2/02	Portarlington pier.	RBa
	1200+	16/5/02	Eynesbury.	GFNC
Little Lorikeet	2	3/3/02	Belmont, Barwon Valley Park.	RBa
Horsefield's Bronze-Cuckoo	2	13/5/02	Breakfast Creek. Overwintering or late departing?	JN
Shining Bronze-Cuckoo	1	13/5/02	Breakfast Creek. Overwintering or late departing?	JN
Powerful Owl	1	2/5/02	Bellbrae. Portneath Rd. Perched in roadside tree.	PhW
Australian Owlet-nightjar	2	2/3/02	Bannockburn Reserve. 2 calling.	GB
White-throated Needletail	Many	24/3/02	Eastern View and Anglesea.	GB
Rainbow Bee-eater	2	1/3/02	Bannockburn Reserve.	GB
Red Wattlebird	202	3/5/02	St Leonards Salt Lagoon, flocks continually flying N.	MHe
Spiny-cheeked Honeyeater	1+	10/5/02	Fyansford Common.	BAt
Yellow-faced Honeyeater	Many	2/5/02	Point Addis, flocks of 10-20 flying NW.	GMc
Yellow-tufted Honeyeater	Many	18/5/02	Bamganie State Forest. Many small flocks of 8-10 birds.	GB
Fuscous Honeyeater	3	23/4/02	Brisbane Ranges, Stony Creek picnic ground. Also 2 on 8/5.	MHe
	4	27/4/02	Brisbane Ranges, Griffens Hill Track.	MHe, JB, JCa, DHe
	1	27/4/02	Brisbane Ranges, Little River picnic ground.	MHe
	2+	18/5/02	Bamganie State Forest. First seen here.	GB
Eastern Spinebill	4	27/4/02	Highton, in garden. 2 on 1/5/02.	RBa
Scarlet Robin	2	26/4/02	Bacchus Marsh. A pair.	MHe
	2	18/5/02	Bamganie State Forest. A pair.	GB
Red-capped Robin	1	23/4/02	Brisbane Ranges, Stony Creek picnic ground. Immature, red-brown forehead, white tail edges, cream wingbar, smudgy grey breast. Brown Pink Robin in same area.	MHe, DHe
Flame Robin	3	23/4/02	Lake Merrimu. A male singing.	MHe
Pink Robin	1	24/4/02	Brisbane Ranges, Stony Creek picnic ground. Brown bird.	MHe, DHe
	1	4/5/02	Serendip.	GMc
	1	18/5/02	Bamganie State Forest. Brown bird.	GB
Spotted Quail-thrush	3	6/4/02	Brisbane Ranges, Nelsons Lookout Track.	JH
Restless Flycatcher	3	18/5/02	You Yangs, Western Plantation.	MHe, DHe
Olive-backed Oriole	1	16/5/02	Eynesbury. Late in season.	GFNC
Dusky Woodswallow	5	1/3/02	Bannockburn Bush.	GB
	3	10/5/02	Fyansford Common.	BAt
White-winged Chough	14	4/5/02	Serendip.	RBa
Zebra Finch	15	17/4/02	Lara. Accompanied by almost white bird, species uncertain!	JH
Beautiful Firetail	10+	13/5/02	Breakfast Creek. Scattered along roadside, calling.	JN
Mistletoebird	20+	15/5/02	Upstream of Yollinko Wetlands.	BAt

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